

# GENERATION BRANDS, LLC TEST REPORT

## SCOPE OF WORK

LED Performance Testing

## MODEL NUMBER

ESLTP4300930

## PROJECT NUMBER

G104207161

## REPORT NUMBER

104207161CRT-009

## ISSUE DATE

9/29/2020

## REVISED DATE

None

## TEST DATES

9/25/2020

## DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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**REPORT NUMBER**

104207161CRT-009

**MODEL NUMBER(s)**

ESLTP4300930

**REPORT RENDERED TO:**

GENERATION BRANDS, LLC  
7400 LINDER AVE  
SKOKIE, IL 60077

**STATEMENT OF LIMITATION**

NVLAP Lab Code 100402-0. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

**AUTHORIZATION**

The testing performed was authorized by signed quote number Qu-01040731-2.

**TEST STANDARDS**

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:



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Reviewer:



Jeff Davis  
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**SAMPLE INFORMATION**

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**ITEMS RECEIVED**

| Item No. | Control No.        | Model No.    | Description | Type       | Received  |
|----------|--------------------|--------------|-------------|------------|-----------|
| 1        | CRT2009221018-001A | ESLTP4300930 | LED Tape    | Production | 9/22/2020 |

## SUMMARY

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### PRODUCT INFORMATION AND SUMMARY OF DATA

|                      |                     |
|----------------------|---------------------|
| Product Model No.:   | ESLTP4300930        |
| Product Description: | LED Tape            |
| LED Model No.:       | Valent X ~250 lm/ft |
| Driver Model No.:    | N/A                 |
| Light Source:        | LED                 |

| Criteria                         | Results         |                    |
|----------------------------------|-----------------|--------------------|
|                                  | Goniophotometer | Integrating Sphere |
| Light Output (lumens)            | 1117.1          | 1108.3             |
| Input Power (W) @ 24 (Vdc)       | 9.17            | 9.37               |
| Lumen Efficacy (lm/W)            | 121.8           | 118.3              |
| Input Power Factor () @ 24 (Vdc) | --              | --                 |

| Criteria                         | Results |
|----------------------------------|---------|
| Input ATHD (%) @ 24 (Vdc)        | ---     |
| Correlated Color Temperature (K) | 3026    |
| Color Rendering Index - Ra ()    | 98.0    |
| Color Rendering Index - R9 ()    | 98.5    |
| Duv ()                           | 0.0010  |
| Chromaticity Coordinate (x)      | 0.434   |
| Chromaticity Coordinate (y)      | 0.401   |
| Chromaticity Coordinate (u')     | 0.250   |
| Chromaticity Coordinate (v')     | 0.520   |

## TEST METHODS

### SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with IESNA LM-79.

### INTEGRATING SPHERE TESTING

A spectroradiometer and integrating sphere were used to measure the spectral distribution for each EUT resulting in photometric and colorimetric data. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position inside the sphere and stabilization procedures to LM-79 were followed.

### TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

A Type C Mirror Goniophotometer system was used to measure the luminous intensity (candela) at each angle of distribution for the EUT. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position near the EUT at equal height and stabilization procedures to LM-79 were followed.

**TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING**

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**PHOTOMETRIC AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)**

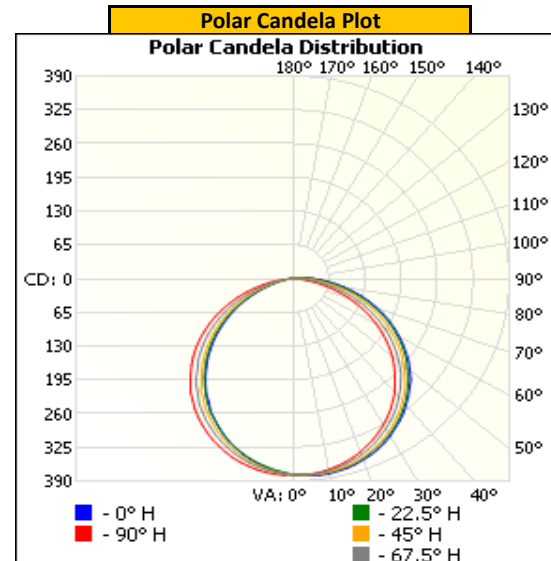
| Base Orientation | Input Voltage (Vdc) | Input Current (mA) | Input Power (W) | Input Power Factor ( ) |
|------------------|---------------------|--------------------|-----------------|------------------------|
| Up               | 23.98               | 382.4              | 9.17            | --                     |

| Light Output (lm) | Lumen Efficacy (lm/W) |
|-------------------|-----------------------|
| 1117.1            | 121.8                 |

**INTENSITY SUMMARY - CANDELA**

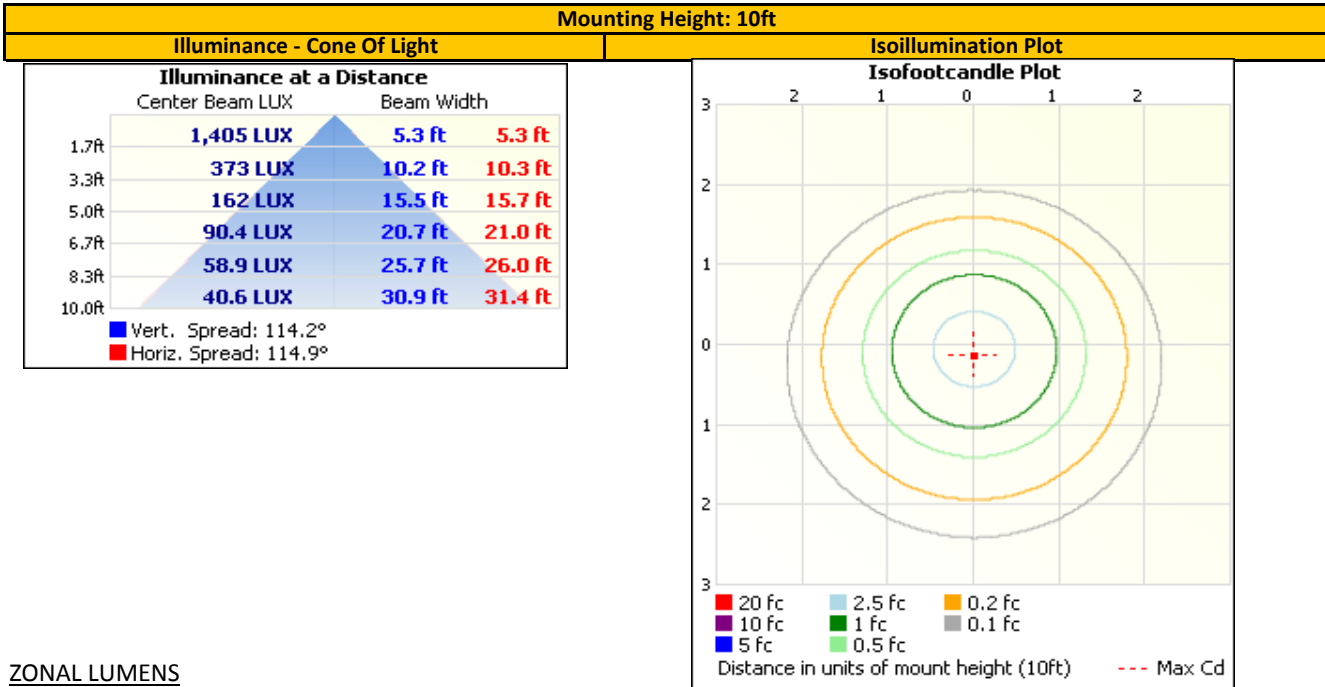
| Angle | 0   | 22.5 | 45  | 67.5 | 90  |
|-------|-----|------|-----|------|-----|
| 0     | 377 | 377  | 377 | 377  | 377 |
| 5     | 381 | 379  | 379 | 378  | 378 |
| 10    | 381 | 379  | 378 | 375  | 373 |
| 15    | 378 | 375  | 374 | 370  | 366 |
| 20    | 371 | 369  | 367 | 361  | 355 |
| 25    | 363 | 360  | 356 | 349  | 342 |
| 30    | 350 | 347  | 343 | 334  | 326 |
| 35    | 335 | 332  | 326 | 317  | 307 |
| 40    | 317 | 314  | 307 | 297  | 286 |
| 45    | 298 | 293  | 287 | 275  | 260 |
| 50    | 276 | 269  | 261 | 249  | 234 |
| 55    | 249 | 244  | 235 | 222  | 205 |
| 60    | 221 | 217  | 205 | 192  | 173 |
| 65    | 191 | 187  | 175 | 159  | 140 |
| 70    | 160 | 155  | 142 | 126  | 106 |
| 75    | 127 | 122  | 109 | 92   | 72  |
| 80    | 94  | 89   | 76  | 59   | 40  |
| 85    | 64  | 59   | 46  | 30   | 14  |
| 90    | 37  | 33   | 22  | 9    | 0   |
| 95    | 17  | 14   | 7   | 0    | 0   |
| 100   | 5   | 3    | 0   | 0    | 0   |
| 105   | 0   | 0    | 0   | 0    | 0   |
| 110   | 0   | 0    | 0   | 0    | 0   |
| 115   | 0   | 0    | 0   | 0    | 0   |
| 120   | 0   | 0    | 0   | 0    | 0   |
| 125   | 0   | 0    | 0   | 0    | 0   |
| 130   | 0   | 0    | 0   | 0    | 0   |
| 135   | 0   | 0    | 0   | 0    | 0   |
| 140   | 0   | 0    | 0   | 0    | 0   |
| 145   | 0   | 0    | 0   | 0    | 0   |
| 150   | 0   | 0    | 0   | 0    | 0   |
| 155   | 0   | 0    | 0   | 0    | 0   |
| 160   | 0   | 0    | 0   | 0    | 0   |
| 165   | 0   | 0    | 0   | 0    | 0   |
| 170   | 0   | 0    | 0   | 0    | 0   |
| 175   | 0   | 0    | 0   | 0    | 0   |
| 180   | 0   | 0    | 0   | 0    | 0   |

Entire luminous intensity matrix found in .IES file



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**ILLUMINANCE SUMMARY**



**ZONAL LUMENS**

| Zonal Lumen Summary |         |           |       |        |       |         |        |       |
|---------------------|---------|-----------|-------|--------|-------|---------|--------|-------|
|                     |         |           |       |        |       |         |        |       |
| Zone                | Lumens  | Luminaire | Zone  | Lumens | Total | Zone    | Lumens | Total |
| 0-30                | 294.7   | 26.4%     | 0-10  | 35.7   | 3.2%  | 90-100  | 4.9    | 0.4%  |
| 0-40                | 484.9   | 43.4%     | 10-20 | 102.6  | 9.2%  | 100-110 | 0.2    | 0.0%  |
| 0-60                | 864.7   | 77.4%     | 20-30 | 156.4  | 14.0% | 110-120 | 0.0    | 0.0%  |
| 60-90               | 247.4   | 22.1%     | 30-40 | 190.2  | 17.0% | 120-130 | 0.0    | 0.0%  |
| 70-100              | 114.3   | 10.2%     | 40-50 | 198.9  | 17.8% | 130-140 | 0.0    | 0.0%  |
| 90-120              | 5.0     | 0.4%      | 50-60 | 180.9  | 16.2% | 140-150 | 0.0    | 0.0%  |
| 0-90                | 1,112.1 | 99.6%     | 60-70 | 137.9  | 12.3% | 150-160 | 0.0    | 0.0%  |
| 90-180              | 5.0     | 0.4%      | 70-80 | 80.4   | 7.2%  | 160-170 | 0.0    | 0.0%  |
| 0-180               | 1,117.1 | 100.0%    | 80-90 | 29.1   | 2.6%  | 170-180 | 0.0    | 0.0%  |

**INTEGRATING SPHERE TESTING**

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**PHOTOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)**

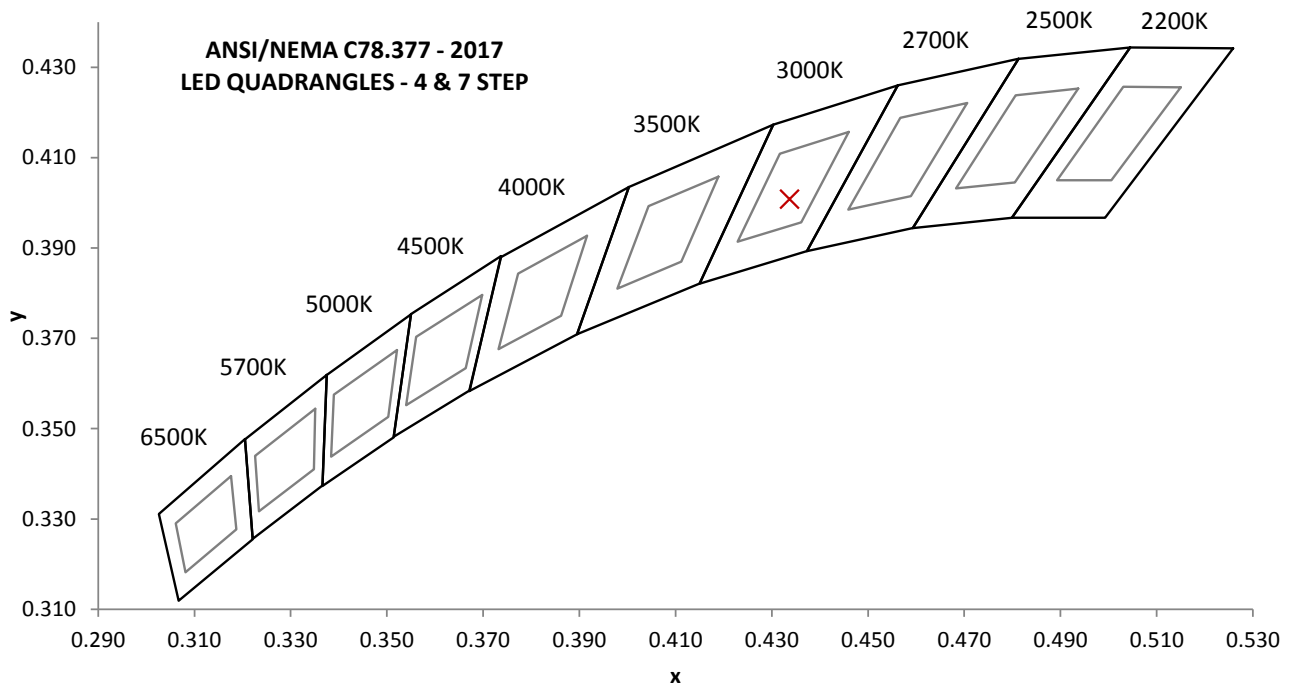
| Base Orientation |
|------------------|
| Up               |

| Input Voltage (Vdc) | Input Current (mA) | Input Power (W) | Input Power Factor (l) | Input ATHD (%) |
|---------------------|--------------------|-----------------|------------------------|----------------|
| 24.00               | 390.2              | 9.37            | --                     | ---            |

**Measured at 24(Vdc)**

| Light Output (lm) | Lumen Efficacy (lm/W) | CCT (K) | CRI - Ra (l) | CRI - R9 (l) |
|-------------------|-----------------------|---------|--------------|--------------|
| 1108.3            | 118.3                 | 3026    | 98.0         | 98.5         |

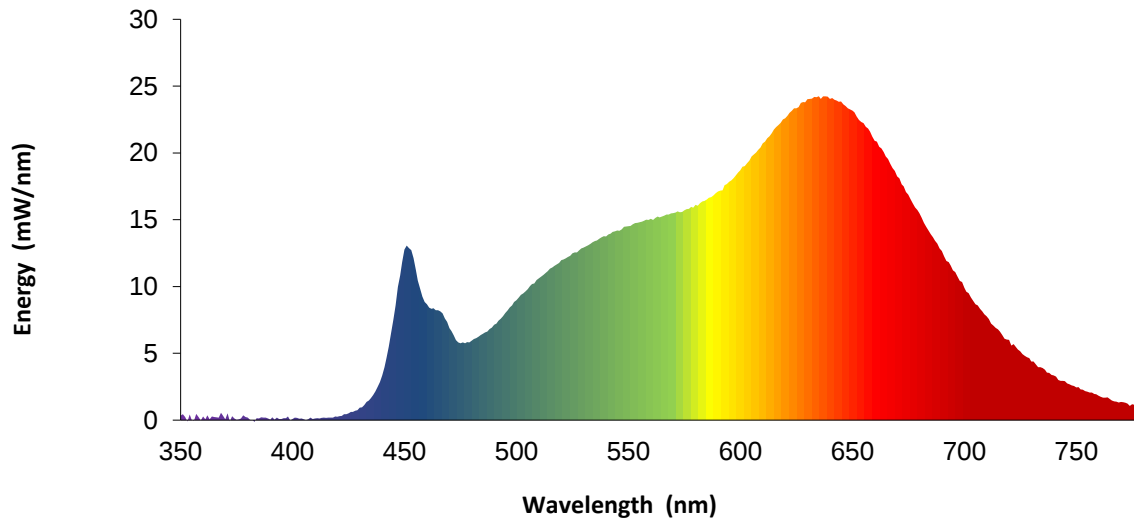
| Duv (l) | 1931 Chrom (x) | 1931 Chrom (y) | 1976 Chrom (u') | 1976 Chrom (v') |
|---------|----------------|----------------|-----------------|-----------------|
| 0.0010  | 0.434          | 0.401          | 0.250           | 0.520           |



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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

| nm  | mW/nm |  | nm  | mW/nm |  | nm  | mW/nm |  | nm  | mW/nm |
|-----|-------|--|-----|-------|--|-----|-------|--|-----|-------|
| 350 | 0.3   |  | 460 | 8.7   |  | 570 | 15.5  |  | 680 | 15.5  |
| 355 | 0.0   |  | 465 | 8.2   |  | 575 | 15.7  |  | 685 | 13.9  |
| 360 | 0.3   |  | 470 | 6.9   |  | 580 | 16.1  |  | 690 | 12.7  |
| 365 | 0.2   |  | 475 | 5.8   |  | 585 | 16.5  |  | 695 | 11.2  |
| 370 | 0.1   |  | 480 | 5.9   |  | 590 | 17.1  |  | 700 | 9.9   |
| 375 | 0.0   |  | 485 | 6.5   |  | 595 | 17.8  |  | 705 | 8.7   |
| 380 | 0.2   |  | 490 | 7.1   |  | 600 | 18.7  |  | 710 | 7.8   |
| 385 | 0.1   |  | 495 | 8.0   |  | 605 | 19.7  |  | 715 | 6.8   |
| 390 | 0.1   |  | 500 | 9.0   |  | 610 | 20.7  |  | 720 | 6.0   |
| 395 | 0.1   |  | 505 | 9.8   |  | 615 | 21.7  |  | 725 | 5.2   |
| 400 | 0.1   |  | 510 | 10.6  |  | 620 | 22.6  |  | 730 | 4.4   |
| 405 | 0.1   |  | 515 | 11.3  |  | 625 | 23.3  |  | 735 | 3.9   |
| 410 | 0.1   |  | 520 | 12.0  |  | 630 | 24.0  |  | 740 | 3.3   |
| 415 | 0.2   |  | 525 | 12.5  |  | 635 | 24.2  |  | 745 | 2.9   |
| 420 | 0.3   |  | 530 | 12.9  |  | 640 | 24.0  |  | 750 | 2.5   |
| 425 | 0.5   |  | 535 | 13.4  |  | 645 | 23.8  |  | 755 | 2.1   |
| 430 | 0.9   |  | 540 | 13.8  |  | 650 | 23.2  |  | 760 | 1.8   |
| 435 | 1.6   |  | 545 | 14.2  |  | 655 | 22.2  |  | 765 | 1.6   |
| 440 | 3.3   |  | 550 | 14.5  |  | 660 | 20.9  |  | 770 | 1.4   |
| 445 | 7.5   |  | 555 | 14.8  |  | 665 | 19.7  |  | 775 | 1.2   |
| 450 | 12.8  |  | 560 | 15.1  |  | 670 | 18.2  |  | 780 | 0.9   |
| 455 | 11.3  |  | 565 | 15.2  |  | 675 | 16.9  |  | --- | ---   |



Portrayed color in graphic is estimated by wavelength (nm) and may not be exact - it is a visual representation only

**EQUIPMENT LIST**

**REPORT NO. 104207161CRT-009**

| #  | Equipment                                    | Model No    | Control No. | Last Cal   | Cal Due    |
|----|----------------------------------------------|-------------|-------------|------------|------------|
| 1  | LSI High Speed Mirror Goniometer             | 6440        | ---         | 9/21/2020  | 10/21/2020 |
| 2  | Elgar AC Power Supply                        | CW1251      | ---         | VBV        | VBV        |
| 3  | Yokogawa Power Analyzer                      | WT210       | E464        | 5/11/2020  | 5/11/2021  |
| 4  | Traceable Hygrothermometer                   | 4800        | L203        | 2/17/2020  | 2/17/2021  |
| 5  | M-D Building Products Digital Level          | Smart Tool  | 307-L112    | 5/14/2020  | 5/14/2021  |
| 6  | NIST Luminous Intensity Standard Source      | NBS10322    | N1427       | 2/11/2019  | 2/11/2021  |
| 7  | NIST Luminous Intensity Standard Source      | NBS10332    | N1435       | 2/11/2019  | 2/11/2021  |
| 8  | NIST Luminous Intensity Standard Source      | NBS10265    | N1437       | 2/11/2019  | 2/11/2021  |
| 9  | NIST Luminous Flux Standard Source           | NBS10428    | N1424       | 1/3/2019   | 1/3/2021   |
| 10 | Sorenson DC Power Supply                     | XG 150-10   | ---         | VBV        | VBV        |
| 11 | Omega Thermometer                            | DPI8-C24    | M263        | 2/27/2020  | 2/27/2021  |
| 12 | 2M Integrating Sphere Spectrometer System    | CDS 600     | W/N308      | 9/1/2020   | 10/1/2020  |
| 13 | Yokogawa Power Analyzer                      | WT1600      | E475        | 8/10/2020  | 8/10/2021  |
| 14 | Digital Thermometer                          | Fluke 53 II | 307-D587    | 1/23/2020  | 1/23/2021  |
| 15 | Xantrex DC Power Supply                      | XTR 150-5.6 | ---         | VBV        | VBV        |
| 16 | Elgar AC Power Supply                        | CW1251      | ---         | VBV        | VBV        |
| 17 | Secondary Spectral Intensity Standard Source | BS5186      | RF5186      | 11/21/2019 | 11/21/2020 |
| 18 | Secondary Flux Standard Source               | 6836        | ---         | 2/11/2020  | 2/11/2021  |
| 19 | Secondary Flux Standard Source               | 4116        | ---         | 2/11/2020  | 2/11/2021  |
| 20 | Secondary Flux Standard Source               | 3616        | ---         | 2/11/2020  | 2/11/2021  |
| 21 | Fisher Scientific Digital Stopwatch          | 130471471   | 307-N1404   | 3/19/2020  | 3/19/2021  |

Note: Standard sources listed above are traceable to NIST: National Institute of Standards and Technology

**REVISION HISTORY**

| #   | Revision Date | Updated By | Reviewed By | Description of Change |
|-----|---------------|------------|-------------|-----------------------|
| --- | None          | ---        | ---         | ---                   |
| --- | ---           | ---        | ---         | ---                   |
| --- | ---           | ---        | ---         | ---                   |